

REMARKS

Applicant respectfully requests further examination and reconsideration in view of the arguments set forth fully below. Claims 1-132 were previously pending. Of the above claims, claims 14-24, 36-46, 58-69 and 71-132 were previously withdrawn from consideration. In the Office Action mailed July 19, 2004, Claims 1-13, 25-35, 47-57 and 70 have been rejected. By the above amendments, Claims 13, 35, 57 and 70 have been amended. Accordingly, Claims 1-13, 25-35, 47-57 and 70 are currently pending. Favorable reconsideration is respectfully requested in view of the remarks below.

Rejections under 35 U.S.C. § 112

Within the Office Action, Claim 4 has been rejected “because the claim includes elements ‘a minimum volume and a maximum volume’ not actually disclosed, thereby rendering the scope of the claim unascertainable.” The Applicants respectfully traverse this rejection. The phrase “a minimum volume and a maximum volume” describing the compressible objects appears in the specification on page 2, lines 31-32; and generally from page 12, line 1 to page 16, line 12, including Figure 10. One skilled in the art would recognize and know how to practice the claimed invention using “a minimum volume and maximum volume” upon reading the specification. Further, a search of the patent database from 1976 forward using the field code ACLM/”minimum volume” and ACLM/”maximum volume” resulted in 230 issued patents. Thus, the phrase “a minimum volume and maximum volume” is intelligible and capable of being understood in the context of the patent specification.

Within the Office Action, Claims 2, 26 and 48 have been rejected “because it is unclear whether the limitations following the phrase “predetermined level” are part of the claimed invention.” The Applicants respectfully traverse this rejection. The phrase “predetermined level” describing the compressible objects appears in the specification on page 2, lines 29-31; page 4, lines 13-14; and page 12, line 4. One skilled in the art would recognize and know how to practice the claimed invention using a “predetermined level” upon reading the specification. Further, a search of the patent database from 1976 forward using the field code “ACLM/predetermined” resulted in 529,297 issued patents. Thus, the phrase “predetermined level” is intelligible and capable of being understood in the context of the patent specification.

Within the Office Action, Claims 13, 24 and 57 have been rejected “because it is unclear whether the limitations following the phrase ‘other suitable plastic materials’ are part of the

claimed invention.” Claim 24 was withdrawn from consideration. By the above amendments to Claims 13 and 57, appropriate corrections have been made.

Within the Office Action, Claim 70 has been rejected “because the claim includes elements not actually disclosed, thereby rendering the scope of the claim unascertainable.” By the above amendment to Claim 70, appropriate corrections have been made.

Rejections Under 35 U.S.C. § 102

Within the Office Action, Claims 1, 4-8, 25, 28-31, 47, 50-53 and 70 have been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Mitchell (U.S. Patent Number 6,253,836). Also within the Office Action, Claims 1, 2, 4-7, 25-26, 28, 31, 47-48, 50 and 70 have been rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kitano et al., U.S. 2002/0075645, (hereinafter “Kitano”). The Applicants respectfully traverse this rejection.

Mitchell discloses a notebook computer having a base housing with a heat-generating microprocessor therein, and a lid housing pivotally connected to the base housing. Operating heat from the microprocessor is transferred to the lid housing, for dissipation therefrom, via a specially designed thermosyphoning heat pipe structure formed from first and second heat pipes. The first heat pipe representatively has a rectangular cross-section, an evaporating portion thermally communicated with the microprocessor, and a coiled condensing portion centered about the lid hinge line and having a circularly cross-sectioned interior side surface portion defined by flat sides of the first heat pipe. The second heat pipe has a circular cross-section, an evaporating portion pivotally received within the coiled first heat pipe portion, and a condensing portion thermally communicated with the lid housing. When the lid housing is opened and closed, the evaporating portion of the second heat pipe is rotated within the coiled first heat pipe portion and slidably engages its circularly cross-sectioned interior side portion. [Abstract]. Mitchell does not disclose, teach or suggest one or more compressible objects coupled to inlet and outlet ports. Mitchell also does not disclose, teach or suggest that the one or more compressible objects reduce a volume of the inlet and outlet ports in an unpressured condition, or that pressure exerted on the compressible object increases a volume of the inlet port and the outlet port. Further, Mitchell does not disclose, teach or suggest one or more compressible objects immersed in the enclosure.

Kitano discloses a liquid cooling system for cooling a high heat generating body, such as a semiconductor element or the like, used in an electronic apparatus being small and thin in sizes,

or a personal computer equipped with such the structure therein, comprising a pump of reciprocal movement type, a heat receiving jacket, a heat radiation pipe, and a connector pipe for connecting those parts with one another, wherein those are disposed to form a closed loop and are filled up with cooling liquid therein. [Abstract]. Kitano also discloses expansible portions of the connector pipe [Figures 2-10], such that “due to the pressure of the cooling liquid, the expansible portion is expanded . . . when the pressure falls down, the check valve is opened, and the cooling liquid within the connector pipe flows into an inside of the pump while the expansible portion turns back to the original position. [Kitano, paragraph 0048]. Kitano does not disclose, teach or suggest one or more compressible objects coupled to inlet and outlet ports. Kitano also does not disclose, teach or suggest that the one or more compressible objects reduce a volume of the inlet and outlet ports in an unpressured condition, or that pressure exerted on the compressible object increases a volume of the inlet port and the outlet port. In Kitano, the connector pipe is in an original, not reduced, volume position during an unpressured condition. Kitano also does not disclose, teach or suggest one or more compressible objects immersed in the enclosure. Instead, Kitano discloses flexible portions connected to walls of the connector pipe. Further, Kitano does not disclose expanding a volume condition with fluid expansion during freezing.

In contrast to the teachings of Mitchell, Kitano, the method and apparatus of the present invention utilizes, inter alia, compressible objects to protect against expansion of water-based solutions when frozen. In such a system, pipes, pumps, and heat exchangers are designed to prevent cracking of their enclosures and chambers. In one embodiment, one or more compressible objects are coupled to inlet and outlet ports in an unpressured condition such that the compressible objects reduce a volume of the inlet and outlet ports and further wherein pressure exerted on the compressible object increases a volume of the inlet port and the outlet port. In another embodiment, one or more compressible objects are immersed in the enclosure.

The independent Claim 1 is directed to an for preventing cracking of a liquid system. The apparatus includes at least one heat exchanger; at least one inlet port extending through a first opening for conveying a fluid to a plurality of channels and passages; at least one outlet port extending through a second opening for discharging the fluid from the plurality of channels and passages; and one or more compressible objects coupled to the inlet and outlet ports in an unpressured condition such that the compressible objects reduce a volume of the inlet port and the outlet port and further wherein pressure exerted on the compressible object increases a volume of the inlet port and the outlet port. As described above, neither Mitchell nor Kitano

disclose, teach or suggest one or more compressible objects coupled to inlet and outlet ports. Also, neither Mitchell nor Kitano disclose, teach or suggest that the one or more compressible objects reduce a volume of the inlet and outlet ports in an unpressured condition, or that pressure exerted on the compressible object increases a volume of the inlet port and the outlet port. For at least these reasons, the independent Claim 1 is allowable over the teachings of Mitchell and Kitano.

Claims 2-13 are all dependent on the independent Claim 1. As discussed above, the independent Claim 1 is allowable over the teachings of Mitchell and Kitano. Accordingly, the dependent Claims 2-13 are all also allowable as being dependent on an allowable base claim.

The independent Claim 25 is directed to an apparatus for preventing cracking of a liquid system. The apparatus comprises an enclosure; and one or more compressible objects immersed in the enclosure. As described above, neither Mitchell nor Kitano disclose, teach or suggest one or more compressible objects immersed in an enclosure. For at least these reasons, the Independent Claim 25 is allowable over the teachings of Mitchell and Kitano.

Claims 26-35 are all dependent on the independent Claim 25. As discussed above, the independent Claim 25 is allowable over the teachings of Mitchell and Kitano. Accordingly, the dependent Claims 26-35 are all also allowable as being dependent on an allowable base claim.

The independent Claim 47 is directed to a method of preventing cracking of a liquid system. The system includes one or more pumps and one or more heat exchangers. The method comprises the steps of providing an enclosure; and immersing one or more compressible objects in the enclosure. As described above, neither Mitchell nor Kitano disclose, teach or suggest one or more compressible objects immersed in an enclosure. For at least these reasons, the Independent Claim 47 is allowable over the teachings of Mitchell and Kitano.

Claims 48-57 are all dependent on the independent Claim 47. As discussed above, the independent Claim 47 is allowable over the teachings of Mitchell and Kitano. Accordingly, the dependent Claims 48-57 are all also allowable as being dependent on an allowable base claim.

The independent Claim 70 is directed to a an apparatus for preventing cracking of a liquid system. The system includes one or more pumps and one or more heat exchangers. The apparatus comprises an enclosure, wherein the enclosure being capable of contracting and expanding between a minimum volume condition and a maximum volume condition with fluid expansion during freezing. As mentioned above, neither Mitchell nor Kitano disclose, teach or suggest an enclosure capable of contracting and expanding between a minimum volume

condition and a maximum volume condition with fluid expansion during freezing. For at least these reasons, the independent Claim 70 is allowable over the teachings of Mitchell and Kitano.

Rejections Under 35 U.S.C. § 103

Within the Office Action, Claims 3, 27 and 49 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kitano. Also within the Office Action, Claims 8-13, 29-35 and 51-57 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kitano. The Applicant respectfully disagrees with this rejection.

Claims 3 and 8-13 are all dependent on the independent Claim 1. As discussed above, the independent Claim 1 is allowable. Accordingly, the dependent Claims 3 and 8-13 are all also allowable as being dependent on an allowable base claim.

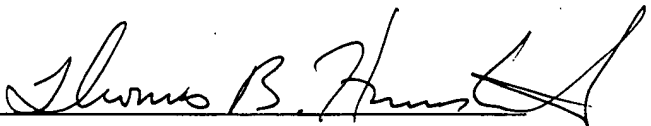
Claims 27 and 29-35 are all dependent on the independent Claim 25. As discussed above, the independent Claim 25 is allowable. Accordingly, the dependent Claims 27 and 29-35 are all also allowable as being dependent on an allowable base claim.

Claims 49 and 51-57 are all dependent on the independent Claim 47. As discussed above, the independent Claim 47 is allowable. Accordingly, the dependent Claims 49 and 51-57 are all also allowable as being dependent on an allowable base claim.

No new subject matter has been added by way of the above amendments. For the reasons given above, Applicant respectfully submits that the Claims 1-13, 25-35, 47-57 and 70 are now in a condition for allowance, and allowance at an early date would be appreciated. Should the Examiner have any questions or comments, they are encouraged to call the undersigned at (408) 530-9700 to discuss the same so that any outstanding issues can be expeditiously resolved.

Respectfully submitted,
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